

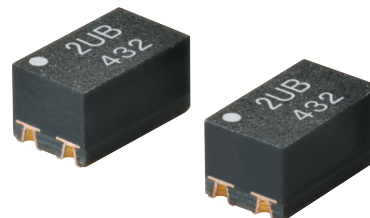
MOS FET Relays G3VM-41UR10/51UR

World's Smallest New VSON Package with Low Output Capacitance and Low ON Resistance (Low C × R)

- RoHS Compliant

Application Examples

- Semiconductor test equipment
- Test & measurement devices
- Data loggers
- Communication equipment



NEW

Note: The actual product is marked differently from the image shown here.

List of Models

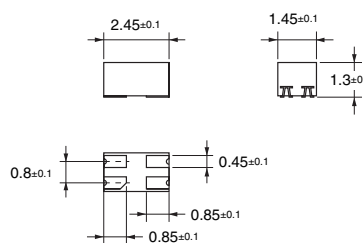
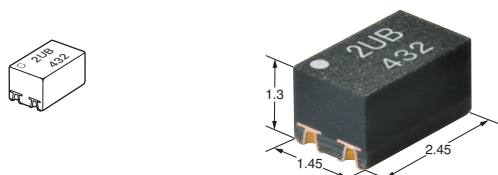
Package type	Contact form	Terminals	Load voltage (peak value)	Continuous Load Current (peak value)	Model	Minimum Packaging Quantity
VSON4	SPST-NO (1FormA)	Surface-mounting terminals	40 VAC or VDC	120 mA	G3VM-41UR10	---
					G3VM-41UR10(TR05)	500
			50 VAC or VDC	300 mA	G3VM-51UR	---
					G3VM-51UR(TR05)	500

Note: G3VM-41UR10 and G3VM-51UR, without “(TR05)”, are provided as a Tape-cut versions, for sample purposes. Tape-cut VSON's are packaged without humidity resistance. Use manual soldering to mount them.

Dimensions

Note: All units are in millimeters unless otherwise indicated.

G3VM-41UR10
G3VM-51UR

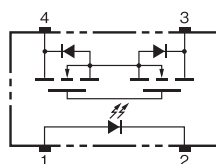


Weight: 0.01 g

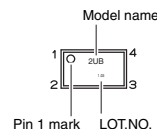
Note: The actual product is marked differently from the image shown here.

Terminal Arrangement/Internal Connections (Top View)

G3VM-41UR10
G3VM-51UR



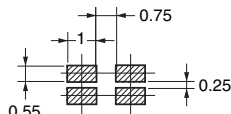
VSON (Very Small Outline Non-leaded)
VSON4



Note: The actual product is marked differently from the image shown here.

Actual Mounting Pad Dimensions (Recommended Value, Top View)

G3VM-41UR10
G3VM-51UR



■ Absolute Maximum Ratings (Ta = 25°C)

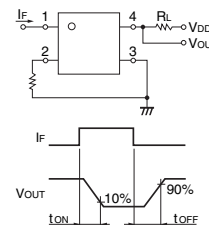
Item		Symbol	G3VM-41UR10	G3VM-51UR	Unit	Measurement Conditions
Input	LED forward current	I_F	30		mA	
	LED forward current reduction rate	$\Delta I_F/^\circ\text{C}$	-0.3		mA/°C	$T_a \geq 25^\circ\text{C}$
	LED reverse voltage	V_R	5		V	
	Connection temperature	T_J	125		°C	
Output	Load voltage (AC peak/DC)	V_{OFF}	40	50	V	
	Continuous load current	I_O	120	300	mA	
	ON current reduction rate	$\Delta I_{ON}/^\circ\text{C}$	-1.2	-3	mA/°C	$T_a \geq 25^\circ\text{C}$
	Pulse ON current	I_{OP}	360	900	mA	$t=100\text{ms}, \text{Duty}=1/10$
	Connection temperature	T_J	125		°C	
Dielectric strength between input and output (See note 1.)		V_{I-O}	300		V_{rms}	AC for 1 min
Ambient operating temperature		T_a	-40 to +85		°C	With no icing or condensation
Ambient storage temperature		T_{stg}	-40 to +125		°C	
Soldering temperature		---	260		°C	10 s

Note: 1. The dielectric strength between the input and output was checked by applying voltage between all pins as a group on the LED side and all pins as a group on the light-receiving side.

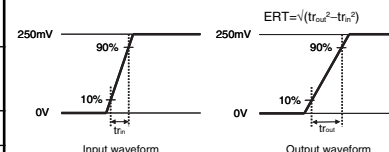
■ Electrical Characteristics (Ta = 25°C)

Item		Symbol	G3VM-41UR10	G3VM-51UR	Unit	Measurement conditions	
Input	LED forward voltage	V_F	Minimum	1.1		V	$I_F = 10 \text{ mA}$
			Typical	1.27			
			Maximum	1.4			
	Reverse current	I_R	Maximum	10		μA	$V_R = 5 \text{ V}$
	Capacity between terminals	C_T	Typical	30		pF	$V = 0, f = 1 \text{ MHz}$
Output	Trigger LED forward current	I_{FT}	Maximum	3.0		mA	$I_O = 100 \text{ mA}$
	Release LED forward current	I_{FC}	Minimum	0.1		mA	$I_{OFF} = 10 \mu\text{A}$
	Maximum resistance with output ON	R_{ON}	Typical	12	1	Ω	$I_F = 5 \text{ mA}, t < 1 \text{ s}$ -41UR10 : $I_O = 120 \text{ mA}$ -51UR : $I_O = 300 \text{ mA}$
			Maximum	14	1.5		
	Current leakage when the relay is open	I_{LEAK}	Maximum	1		nA	-41UR10 : $V_{OFF} = 40 \text{ V}$ -51UR : $V_{OFF} = 50 \text{ V}$
Capacity between terminals	C_{OFF}	Typical	0.45	12	pF	$V = 0, f = 100 \text{ MHz}, t < 1 \text{ s}$	
		Maximum	0.8	20			
Capacity between I/O terminals		C_{I-O}	Typical	1		pF	$f = 1 \text{ MHz}, V_s = 0 \text{ V}$
Insulation resistance between I/O terminals		R_{I-O}	Typical	10^8		M Ω	$V_{I-O} = 500 \text{ VDC}, R_{OH} \leq 60\%$
Turn-ON time		t_{ON}	Maximum	0.2	0.5	ms	$I_F = 5 \text{ mA}, R_L = 200 \Omega, V_{DD} = 20 \text{ V}$ (See note 2.)
Turn-OFF time		t_{OFF}	Maximum	0.3	0.4		
Equivalent rise time		ERT	Typical	---	40	ps	$I_F = 5 \text{ mA}, V_{DD} = 0.25 \text{ V}$ $Tr(in)=25\text{ps}$ (See note 3.)
			Maximum	---	90		

Note: 2. Turn-ON and Turn-OFF Times



Note: 3. Equivalent Rise Time



■ Recommended Operating Conditions

For usage with high reliability, the Recommended Operating Conditions are measures that takes into account the derating of the Absolute Maximum ratings and the Electrical Characteristics. Each item on this list is an independent condition, not simultaneously satisfying several conditions.

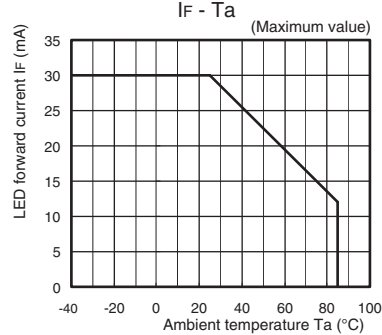
Item	Symbol		G3VM-41UR10	G3VM-51UR	Unit
Load voltage (AC peak/DC)	V_{DD}	Maximum	32	40	V
Operating LED forward current	I_F	Minimum	5		mA
		Typical	7.5		
		Maximum	20		
Continuous load current (AC peak/DC)	I_O	Maximum	120	300	
Ambient Operating temperature	T_a	Minimum	-20		°C
		Maximum	65		

■ **Approved Standards**

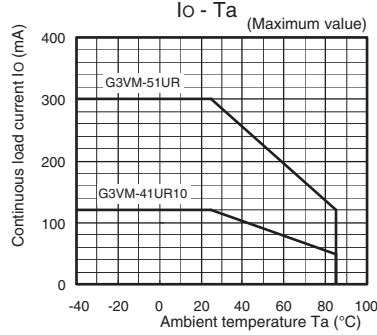
Applying for UL recognition

■ **Engineering Data**

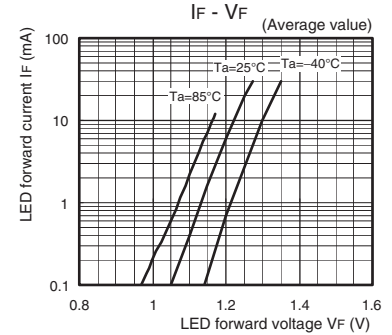
LED forward current vs. Ambient temperature
IF - Ta (Maximum value)



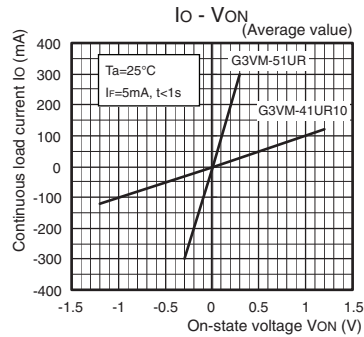
Continuous load current vs. Ambient temperature
Io - Ta (Maximum value)



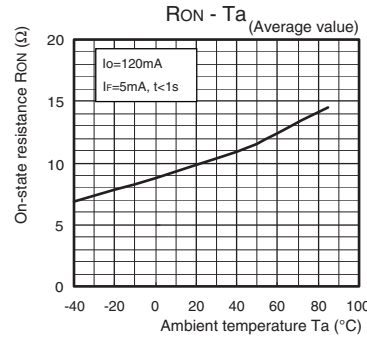
LED forward current vs. LED forward voltage
IF - Vf (Average value)



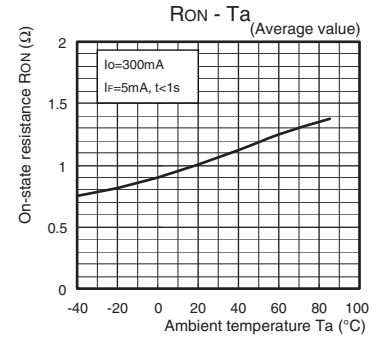
Continuous load current vs. On-state voltage
Io - VON (Average value)



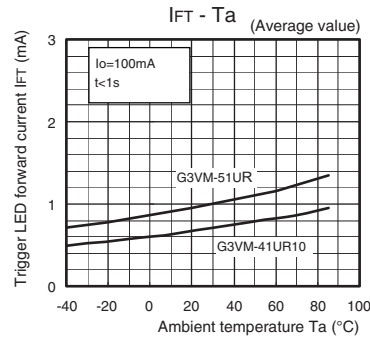
On-state resistance vs. Ambient temperature
G3VM-41UR10
RON - Ta (Average value)



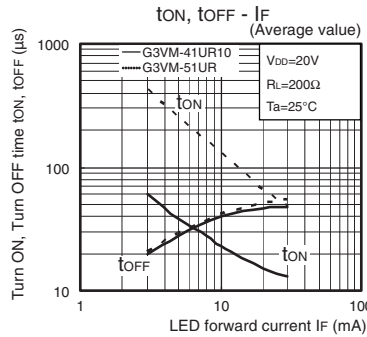
G3VM-51UR
RON - Ta (Average value)



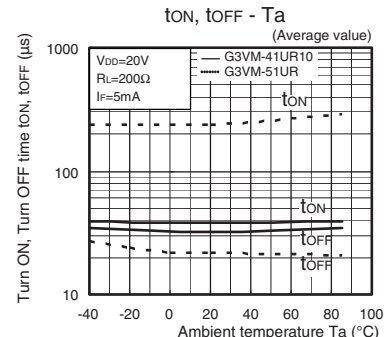
Trigger LED forward current vs. Ambient temperature
IFT - Ta (Average value)



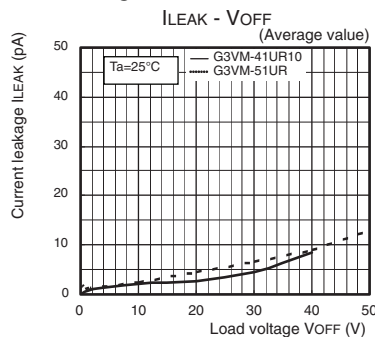
Turn ON, Turn OFF time vs. LED forward current
tON, tOFF - IF (Average value)



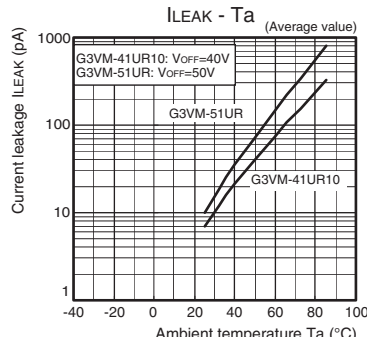
Turn ON, Turn OFF time vs. Ambient temperature
tON, tOFF - Ta (Average value)



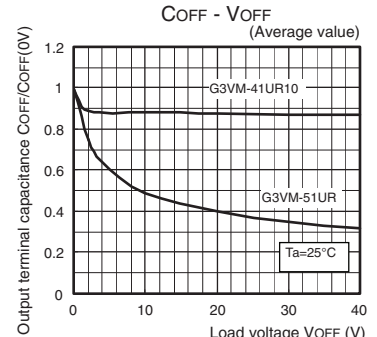
Current leakage vs. Load voltage
ILEAK - VOFF (Average value)



Current Leakage vs. Ambient Temperature
ILEAK - Ta (Average value)



Output terminal capacitance vs. Load voltage
COFF - VOFF (Average value)



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09/14

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